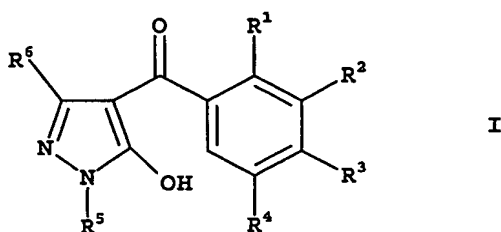


We claim:

1. A synergistic herbicidal mixture comprising

5 A) at least one 3-heterocyclyl-substituted benzoyl derivative of the formula I



10 in which the variables have the following meanings:

R^1 , R^3 are halogen, C_1 - C_6 -alkyl, C_1 - C_6 -haloalkyl, C_1 - C_6 -alkoxy, C_1 - C_6 -haloalkoxy, C_1 - C_6 -alkylthio, C_1 - C_6 -alkylsulfinyl or C_1 - C_6 -alkylsulfonyl;

15 R^2 is a heterocyclic radical selected from the group: isoxazol-3-yl, isoxazol-4-yl, isoxazol-5-yl, 4,5-dihydroisoxazol-3-yl, 4,5-dihydroisoxazol-4-yl and 4,5-dihydroisoxazol-5-yl, it being possible for
20 the six radicals mentioned to be unsubstituted or mono- or polysubstituted by halogen, C_1 - C_4 -alkyl, C_1 - C_4 -alkoxy, C_1 - C_4 -haloalkyl, C_1 - C_4 -haloalkoxy or C_1 - C_4 -alkylthio;

25 R^4 is hydrogen, halogen or C_1 - C_6 -alkyl;

R^5 is C_1 - C_6 -alkyl;

R^6 is hydrogen or C_1 - C_6 -alkyl;

30 or one of its environmentally compatible salts;

and

B) two herbicides selected from the group including imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr;

5 or one of its environmentally compatible salts;

and, if desired,

10 C) at least one herbicidal compound from the group of the acetyl-CoA carboxylase inhibitors (ACC), acetolactate synthase inhibitors (ALS), amides, auxin herbicides, auxin transport inhibitors, carotenoid biosynthesis inhibitors, enolpyruvylshikimate 3-phosphate synthase inhibitors (EPSPS), glutamine synthetase inhibitors,
15 lipid biosynthesis inhibitors, mitosis inhibitors, protoporphyrinogen IX oxidase inhibitors, photosynthesis inhibitors, synergists, growth substances, cell wall biosynthesis inhibitors and a variety of other herbicides;

20

in a synergistically effective amount.

2. A synergistic herbicidal mixture as claimed in claims 1,
25 comprising, as component A), a 3-heterocyclyl-substituted benzoyl derivative of the formula I, where R⁴ is hydrogen.

3. A synergistic herbicidal mixture as claimed in any of claims 1 to 2, comprising, as component A), a 3-heterocyclyl-substituted benzoyl derivative of the formula I, where
30

R¹ is halogen, C₁-C₆-alkyl or C₁-C₆-alkylsulfonyl;

R³ is halogen or C₁-C₆-alkylsulfonyl;

35

4. A synergistic herbicidal mixture as claimed in any of claims 1 to 3, comprising, as component A), a 3-heterocyclyl-substituted benzoyl derivative of the formula I, where

R² is a heterocyclic radical selected from the group:
isoxazol-3-yl, isoxazol-5-yl and 4,5-dihydroisoxazol-3-yl, it being possible for the three radicals mentioned to be unsubstituted or mono- or polysubstituted by
5 halogen, C₁-C₄-alkyl, C₁-C₄-alkoxy, C₁-C₄-haloalkyl, C₁-C₄-haloalkoxy or C₁-C₄-alkylthio.

5. A synergistic herbicidal mixture as claimed in any of claims 1 to 4, comprising, as component A), a 3-heterocyclyl-substituted benzoyl derivative of the formula I, where
10

R² is isoxazol-5-yl, 3-methyl-isoxazol-5-yl, 4,5-dihydroisoxazol-3-yl, 5-methyl-4,5-dihydroisoxazol-3-yl, 5-ethyl-4,5-dihydroisoxazol-3-yl or 4,5-dimethyl-4,5-dihydroisoxazol-3-yl.
15

6. A synergistic herbicidal mixture as claimed in any of claims 1 to 5, comprising, as component A), 4-[2-chloro-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole.
20

7. A synergistic herbicidal mixture as claimed in any of claims 1 to 5, comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole.
25

8. A synergistic herbicidal mixture as claimed in any of claims 1 to 7, comprising as component B) imazapyr and imazethapyr.

- 30 9. A synergistic herbicidal mixture as claimed in any of claims 1 to 7, comprising as component B) imazapic and imazapyr.

10. A synergistic herbicidal mixture as claimed in any of claims 1 to 7, comprising, three active ingredients, a 3-heterocyclyl-substituted benzoyl derivative of the formula I (component A) as claimed in claims 1 to 7 and imazapyr and imazethapyr (component B).
35

11. A synergistic herbicidal mixture as claimed in any of claims 1 to 7, comprising, three active ingredients, a 3-heterocyclyl-substituted benzoyl derivative of the formula I (component A) as claimed in claims 1 to 7 and imazapic and imazapyr (component B).
12. A synergistic herbicidal mixture as claimed in any of claims 1 to 7, comprising, at least four active ingredients, a 3-heterocyclyl-substituted benzoyl derivative of the formula I (component A) as claimed in claims 1 to 7;
two herbicides selected from the group including imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic and imazethapyr (component B) as claimed in claims 1;
and
- C) at least one herbicidal compound from the group of the acetyl-CoA carboxylase inhibitors (ACC), acetolactate synthase inhibitors (ALS), amides, auxin herbicides, auxin transport inhibitors, carotenoid biosynthesis inhibitors, enolpyruvylshikimate 3-phosphate synthase inhibitors (EPSPS), glutamine synthetase inhibitors, lipid biosynthesis inhibitors, mitosis inhibitors, protoporphyrinogen IX oxidase inhibitors, photosynthesis inhibitors, synergists, growth substances, cell wall biosynthesis inhibitors and a variety of other herbicides.
13. A synergistic herbicidal mixture as claimed in claim 1 or 12 comprising, as component C), at least one herbicidal compound from the groups C1 to C16:
- C1 acetyl-CoA carboxylase inhibitors (ACC):
cyclohexenone oxime ethers, phenoxyphenoxypropionic esters or arylaminopropionic acids;
- C2 acetolactate synthase inhibitors (ALS):
imidazolinones, pyrimidyl ethers, sulfonamides or sulfonyleureas;

- C3 amides;
- C4 auxin herbicides:
5 pyridinecarboxylic acids, 2,4-D or benazolin;
- C5 auxin transport inhibitors;
- C6 carotenoid biosynthesis inhibitors;
10
- C7 enolpyruvylshikimate 3-phosphate synthase inhibitors
(EPSPS);
- C8 glutamine synthetase inhibitors;
15
- C9 lipid biosynthesis inhibitors:
anilides, chloroacetanilides, thioureas, benfuresate or
perfluidone;
- C10 mitosis inhibitors:
20 carbamates, dinitroanilines, pyridines, butamifos,
chlorthal-dimethyl (DCPA) or maleic hydrazide;
- C11 protoporphyrinogen IX oxidase inhibitors:
25 diphenyl ethers, oxadiazoles, cyclic imides or pyra-
zoles;
- C12 photosynthesis inhibitors:
30 propanil, pyridate, pyridafol, benzothiadiazinones, di-
nitrophenols, dipyridylenes, ureas, phenols, chlorida-
zon, triazines, triazinones, uracils or biscarbamates;
- C13 synergists:
oxiranes;
35
- C14 growth substances:
aryloxyalkanoic acids, benzoic acids or quinolinecar-
boxylic acids;

C15 cell wall synthesis inhibitors:

C16 various other herbicides:

5 dichloropropionic acids, dihydrobenzofurans, phenylacetic acids or aziprotryn, barban, bensulide, benzthiazuron, benzofluor, buminafos, buthidazole, buturon, cafenstrole, chlorbufam, chlorofenprop-methyl, chlo-
10 roxuron, cinmethylin, cumyluron, cycluron, cyprazine, cyprazole, dibenzyluron, dipropetryn, dymron, eglina-
zin-ethyl, endothall, ethiozin, flucabazone, fluorben-
tranyl, flupoxam, isocarbamid, isopropalin, karbuti-
late, mefluidide, monuron, napropamide, napropanilide,
15 nitralin, oxaciclomefone, phenisopham, piperophos, pro-
cyazine, profluralin, pyributicarb, secbumeton, sulfal-
late (CDEC), terbucarb, triazofenamide, triaziflam or
trimeturon;

or their environmentally compatible salts.

20 14. A synergistic herbicidal mixture as claimed in claims 1 or 12, comprising, as component C), at least one herbicidal compound from the groups C1 to C16:

C1 acetyl-CoA carboxylase inhibitors (ACC):

25 - cyclohexenone oxime ethers:
alloxydim, clethodim, cloproxydim, cycloxydim,
sethoxydim, tralkoxydim, butroxydim, clefoxydim or
tepraloxym;
- phenoxyphenoxypropionic esters:
30 clodinafop-propargyl (and, if appropriate, clo-
quintocet), cyhalofop-butyl, diclofop-methyl,
fenoxaprop-ethyl, fenoxaprop-P-ethyl, fen-
thiapropethyl, fluazifop-butyl, fluazifop-P-butyl,
haloxyfop-ethoxyethyl, haloxyfop-methyl, haloxy-
35 fop-P-methyl, isoxapyrifop, propaquizafop, qui-
zalofof-ethyl, quizalofof-P-ethyl or quizalofof-
tefuryl; or
- arylaminopropionic acids:
flamprop-methyl or flamprop-isopropyl;

C2 acetolactate synthase inhibitors (ALS):

- imidazolinones:

5 imazapyr, imazaquin, imazamethabenz-methyl, imazamox, imazapic or imazethapyr;

- pyrimidyl ethers:

pyrithiobac-acid, pyrithiobac-sodium, bispyribac-sodium, KIH-6127 or pyribenzoxym;

- sulfonamides:

10 florasulam, flumetsulam or metosulam; or

- sulfonylureas:

15 amidosulfuron, azimsulfuron, bensulfuron-methyl, chlorimuron-ethyl, chlorsulfuron, cinosulfuron, cyclosulfamuron, ethametsulfuron-methyl, ethoxysulfuron, flazasulfuron, halosulfuron-methyl, imazosulfuron, metsulfuron-methyl, nicosulfuron, primisulfuron-methyl, prosulfuron, pyrazosulfuron-ethyl, rimsulfuron, sulfometuron-methyl, thifensulfuron-methyl, triasulfuron, tribenuron-methyl, triflurosulfuron-methyl, N-[[[4-methoxy-6-(trifluoromethyl)-1,3,5-triazin-2-yl]amino]-carbonyl]-2-(trifluoromethyl)-benzenesulfonamide, sulfosulfuron or iodosulfuron;

25 C3 amides:

- allidochlor (CDAA), benzoylprop-ethyl, bromobutide, chlorthiamid, diphenamid, etobenzanid (benzchlomet), fluthiamide, fosamin or monalide;

30 C4 auxin herbicides:

- pyridine carboxylic acids:

clopyralid or picloram; or

- 2,4-D or benazolin;

35 C5 auxin transport inhibitors:

- naptalame or diflufenzopyr;

C6 carotenoid biosynthesis inhibitors:

- 5 - benzofenap, clomazone (dimethazone), diflufenican,
 fluorochloridone, fluridone, pyrazolynate, pyra-
 zoxifen, isoxaflutole, isoxachlortole, mesotrione,
 sulcotrione (chlormesulone), ketospiradox, flurta-
 mone, norflurazon or amitrol;
- 10 C7 enolpyruvylshikimate-3-phosphate synthase inhibitors
 (EPSPS):
 - glyphosate or sulfosate;
- C8 glutamine synthetase inhibitors:
 - bilanafos (bialaphos) or glufosinate-ammonium;
- 15 C9 lipid biosynthesis inhibitors:
 - anilides:
 anilofos or mefenacet;
 - chloroacetanilides:
 dimethenamid, S-dimethenamid, acetochlor,
 alachlor, butachlor, butenachlor, diethatyl-ethyl,
20 dimethachlor, metazachlor, metolachlor, S-
 metolachlor, pretilachlor, propachlor, prynachlor,
 terbuchlor, thenylchlor or xylachlor;
 - thioureas:
 butylate, cycloate, di-allate, dimepiperate, EPTC,
25 esprocarb, molinate, pebulate, prosulfocarb,
 thiobencarb (benthocarb), tri-allate or ver-
 nolate; or
 - benfuresate or perfluidone;
- 30 C10 mitosis inhibitors:
 - carbamates:
 asulam, carbetamid, chlorpropham, orbencarb,
 pronamid (propyzamid), propham or tiocarbazil;
 - dinitroanilines:
35 benefin, butralin, dinitramin, ethalfluralin, flu-
 chloralin, oryzalin, pendimethalin, prodiamine or
 trifluralin;
 - pyridines:
 dithiopyr or thiazopyr; or

- butamifos, chlorthal-dimethyl (DCPA) or maleic hydrazide;

C11 protoporphyrinogen IX oxidase inhibitors:

- 5 - diphenyl ethers:
acifluorfen, acifluorfen-sodium, aclonifen, bifenox, chlornitrofen (CNP), ethoxyfen, fluordifen, fluoroglycofen-ethyl, fomesafen, furyloxyfen, lactofen, nitrofen, nitrofluorfen or oxyfluorfen;
- 10 - oxadiazoles:
oxadiargyl or oxadiazon;
- cyclic imides:
azafenidin, butafenacil, carfentrazone-ethyl, cinidon-ethyl, flumiclorac-pentyl, flumioxazin, flumipropyn, flupropacil, fluthiacet-methyl, sulfentrazone or thidiazimin; or
- 15 - pyrazoles:
ET-751, JV 485 or nipyraclufen;

20

C12 photosynthesis inhibitors:

- propanil, pyridate or pyridafol;
- benzothiadiazinones:
bentazone;
- 25 - dinitrophenols:
bromofenoxim, dinoseb, dinoseb-acetate, dinoterb or DNOC;
- dipyridylenes:
cyperquat-chloride, difenzoquat-methylsulfate, diguat or paraquat-dichloride;
- 30 - ureas:
chlorbromuron, chlorotoluron, difenoxuron, dimefuron, diuron, ethidimuron, fenuron, fluometuron, isoproturon, isouron, linuron, methabenzthiazuron, methazole, metobenzuron, metoxuron, monolinuron, neburon, siduron or tebuthiuron;
- 35 - phenols:
bromoxynil or ioxynil;
- chloridazon;

- triazines:
ametryn, atrazine, cyanazine, desmetryn, di-
methamethryn, hexazinone, prometon, prometryn,
propazine, simazine, simetryn, terbumeton, ter-
butryn, terbutylazine or trietazine;
 - triazinones:
metamitron or metribuzine;
 - uracils:
bromacil, lenacil or terbacil; or
 - biscarbamates:
desmedipham or phenmedipham;
- C13 synergists:
- oxiranes:
 - tridiphanes;
- C14 growth substances:
- aryloxyalkanoic acids:
2,4-DB, clomeprop, dichlorprop, dichlorprop-P
(2,4-DP-P), fluoroxypyr, MCPA, MCPB, mecoprop, me-
coprop-P, or triclopyr;
 - benzoic acids:
chloramben or dicamba; or
 - quinolinecarboxylic acids:
quinclorac or quinmerac;
- C15 cell wall synthesis inhibitors:
- isoxaben or dichlobenil;
- C16 various other herbicides:
- dichloropropionic acids:
dalapon;
 - dihydrobenzofurans:
ethofumesate;
 - phenylacetic acids:
chlorfenac (fenac); or
 - aziprotryn, barban, bensulide, benzthiazuron, ben-
zofluor, buminafos, buthidazole, buturon, cafen-
strole, chlorbufam, chlorfenprop-methyl, chlo-

roxuron, cinmethylin, cumyluron, cycluron,
cyprazine, cyprazole, dibenzyluron, dipropetryn,
dymron, eglinazin-ethyl, endothall, ethiozin, flu-
cabazone, fluorbentranil, flupoxam, isocarbamid,
5 isopropalin, karbutilate, mefluidide, monuron,
napropamide, napropanilide, nitralin, oxaciclome-
fone, phenisopham, piperophos, procyazine, proflu-
ralin, pyributicarb, secbumeton, sulfallate
(CDEC), terbucarb, triazofenamid, triaziflan or
10 trimeturon;

or their environmentally compatible salts.

- 15 15. A synergistic herbicidal mixture as claimed in 12, compris-
ing, as component C), at least one herbicidal compound from
the groups C9 or C12 as defined in claim 12.
- 20 16. A synergistic herbicidal mixture as claimed in claim 12
comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxa-
zol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-
pyrazole; as component B) two herbicides selected from the
group including imazapyr, imazaquin, imazamethabenz-methyl,
imazamox, imazapic and imazethapyr; and as component C) a
herbicidal compound from the group C9.
- 25 17. A synergistic herbicidal mixture as claimed in claim 12
comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxa-
zol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-
pyrazole, as component B) imazapyr and imazethapyr or ima-
30 zapic and imazapyr, and as component C) a chloroacetanilide.
- 35 18. A synergistic herbicidal mixture as claimed in claim 12 com-
prising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxa-
zol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-
pyrazole, as component B) imazapyr and imazethapyr as compo-
nent C) acetochlor.
19. A synergistic herbicidal mixture as claimed in claim 12 com-
prising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxa-

zol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole, as component B) imazapic and imazapyr, and as component C) acetochlor.

- 5 20. A synergistic herbicidal mixture as claimed in claim 12 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole; as component B) two herbicides selected from the group including imazapyr, imazaquin, imazamethabenz-methyl, 10 imazamox, imazapic and imazethapyr; and as component C) a herbicidal compound from the group C12.
- 15 21. A synergistic herbicidal mixture as claimed in claim 12 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole, as component B) imazapyr and imazethapyr, and as component C) a benzothiadiazone or a triazine.
- 20 22. A synergistic herbicidal mixture as claimed in claim 12 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole, as component B) imazapyr and imazethapyr, and as component C) bentazone.
- 25 23. A synergistic herbicidal mixture as claimed in claim 12 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole, as component B) imazapyr and imazethapyr as component C) atrazine.
- 30 24. A synergistic herbicidal mixture as claimed in claim 12 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-pyrazole, as component B) imazapic and imazapyr, and as component C) a benzothiadiazone or a triazine.
- 35 25. A synergistic herbicidal mixture as claimed in claim 12 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxazol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-

pyrazole, as component B) imazapic and imazapyr, and as component C) bentazone.

26. A synergistic herbicidal mixture as claimed in claim 12
5 comprising, as component A) 4-[2-methyl-3-(4,5-dihydroisoxa-
zol-3-yl)-4-methylsulfonyl-benzoyl]-1-methyl-5-hydroxy-1H-
pyrazole, as component B) imazapic and imazapyr as component
C) atrazine.
- 10 27. Synergistic herbicidal mixture as claimed in any of claims 1
to 26, wherein component A) and B) are present in a weight
ratio of 1:0.001 to 1:500.
- 15 28. Synergistic herbicidal mixture as claimed in any of claims
12 to 26, wherein component A) and component C) are present
in a weight ratio of 1:0.002 to 1:800.
- 20 29. A herbicidal composition comprising a herbicidally active
amount of a synergistic herbicidal mixture as claimed in any
of claims 1 to 28, at least one inert liquid and/or solid
carrier and, if desired, at least one surfactant.
- 25 30. A process for the preparation of herbicidal compositions as
claimed in claim 29, wherein component A), component B), if
desired, component C), at least one inert liquid and/or
solid carrier and, if appropriate, a surfactant are mixed.
- 30 31. A method of controlling undesired vegetation, which com-
prises applying a synergistic herbicidal mixture as claimed
in any of claims 1 to 28 before, during and/or after the
emergence of undesired plants, it being possible for the
herbicidally active compounds of components A), B) and, if
desired, C) to be applied simultaneously or in succession.
- 35 32. A method of controlling undesired vegetation as claimed in
claim 31, wherein the leaves of the crop plants and of the
undesired plants are treated.